



A.D. 1823 N^o 4754.

S P E C I F I C A T I O N

OF

NATHANIEL PARTRIDGE.

FIXING STEAM BOILERS, COPPERS, &c.

L O N D O N :

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Fixing Steam Boilers, Coppers, &c.

PARTRIDGE'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, NATHANIEL PATRIDGE, of Bow Bridge, near Stroud, in the County of Gloucester, Dyer, send greeting.

WHEREAS His most Excellent Majesty King George the Fourth, did,
5 by His Letters Patent under the Great Seal of His United Kingdom, bearing date at Westminster, the Fourteenth day of February, 1823, in the fourth year of His Majesty's reign, give and grant unto me, the said Nathaniel Partridge, my exors, admors, and assigns, His especial licence, full power, sole privilege and authority, that I, the said Nathaniel Partridge, my exors,
10 admors, and assigns, during the term of years therein mentioned, should and lawfully might make, use, exercise and vend, within England, Wales, and the Town of Berwick upon Tweed, my Invention of "AN IMPROVEMENT IN THE SETTING OR FIXING OF STEAM BOILERS OR OTHER COPPERS, AND OF COMMUNICATING HEAT TO BOILERS OR COPPERS, BY WHICH A CONSIDERABLE SAVING OF FUEL
15 WILL BE EFFECTED, AND THE SMOKE MORE EFFECTUALLY CONSUMED;" in which said Letters Patent there is contained a proviso that if I, the said Nathaniel Partridge, shall not particularly describe and ascertain the nature of my said Invention, and in what manner the same is to be performed, by an instrument in writing under my hand and seal, and cause the same to be
20 inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said Letters Patent, that then the said Letters Patent, and all liberties and advantages whatsoever thereby

Partridge's Improvements in Setting or Fixing Steam Boilers, &c.

granted shall utterly cease, determine, and become void, as in and by the same (relation being thereunto had) will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Nathaniel Partridge, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, are particularly described 5 and ascertained in and by the Drawings hereunto annexed, and the following description thereof, (that is to say):—

My improvements in the setting or fixing of boilers consists in a new mode of constructing and directing the flues 'so as to retain the heat and apply it to the surfaces of boilers with increased effect, by which contrivance a very great 10 saving of fuel is obtained, and also two or more boilers may be heated by one furnace. Fig. 1 of the Drawings represents a longitudinal section of the furnace and flues, over which two dying pans are erected. Fig. 2 is an horizontal section of the pans and flues taken through at the dotted line A, B, in Fig. 1, the respective letters referring to the same individual parts in both 15 Figs. *a, b*, are two coppers or boilers employed in dying; *c* is the furnace or fire grate upon which the fuel is ignited; *d* is the first bridge, placed in that situation for the purpose of contracting the flue; over this bridge the flames pass, and along the flue *e* to *f*, which is a second bridge or contraction of the flue; from hence the flames proceed into the second chamber of the flue *g*, 20 and thence upwards through the aperture *h* into the upper range of flues. This upper range will be best seen by reference to Fig. 2. The current of heat rising up the aperture *h* becomes divided, and passes laterally into the chambers *i, i*, and its further progress being partially interrupted by the contracted parts of the flue *k, k*, causes the heat to be retained in the chambers 25 *i, i*. Through these passages *k, k*, the heat passes to the chambers *l, l*, and is again impeaded by the contracted parts of the flue *m, m*. It thence proceeds through the aperture *n* to the farther chambers *o, o*, and *p, p*, where it is partially retained in the manner before described, and ultimately escapes through the chimney *q*. By this construction and direction of the flues the 30 heat is more beneficially employed around the surface of the boiler than by any other construction of flues heretofore devised, and two or more boilers may be effectually heated by one fire upon this plan with nearly the same quantity of fuel which will be required to heat one boiler upon any of the old constructions. If I wish to employ only one of the boilers, as *a*, 35 a valve may be opened between the two boilers, as *r*, Fig. 1, by which the heat will ascend into the aperture *n*, and pass thence to the chambers *o, o*, & *p, p*, round the boiler *a*, and there effect its purpose without communicating any considerable portion of heat to the boiler *b*. In some cases it may be

FIG. 1.

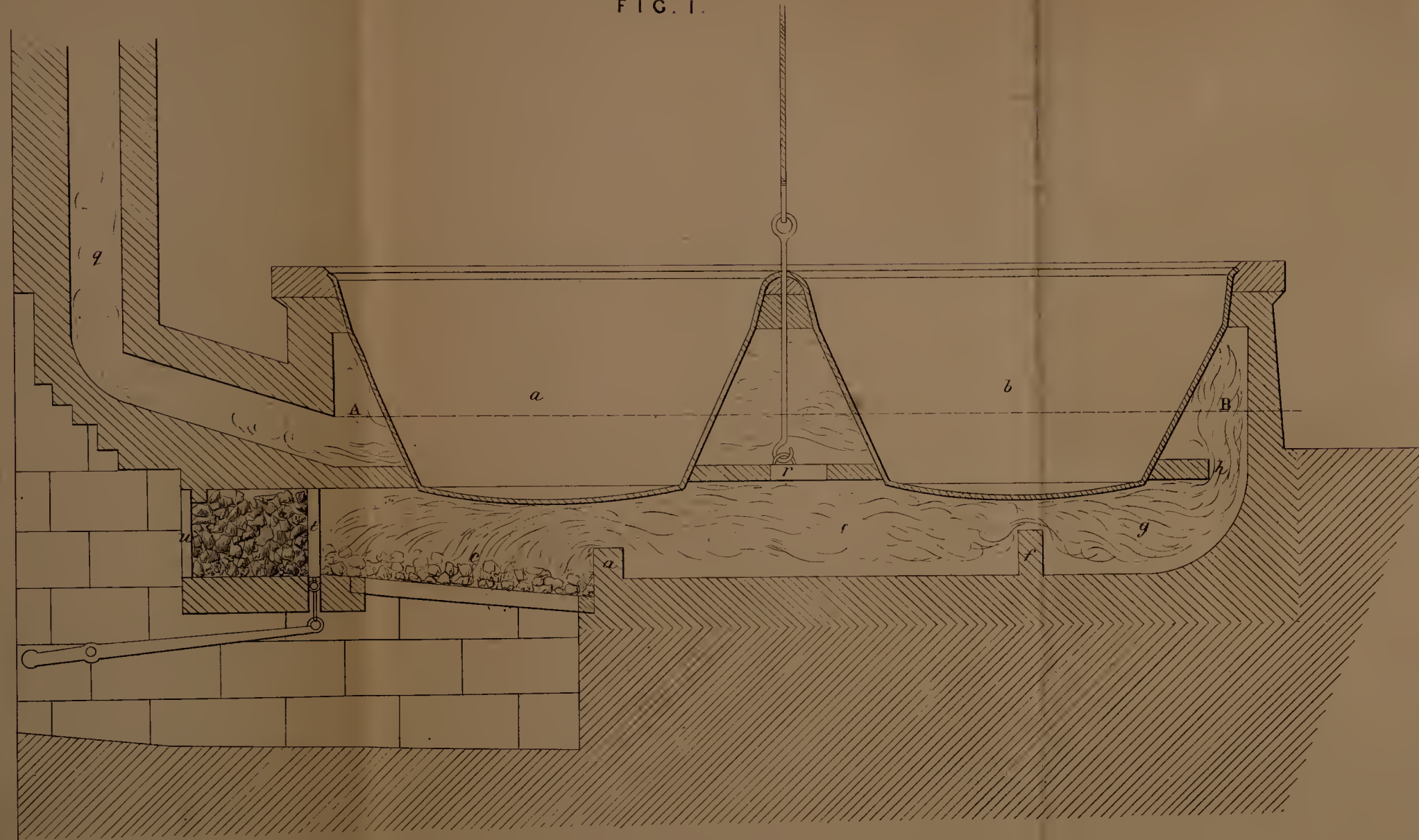
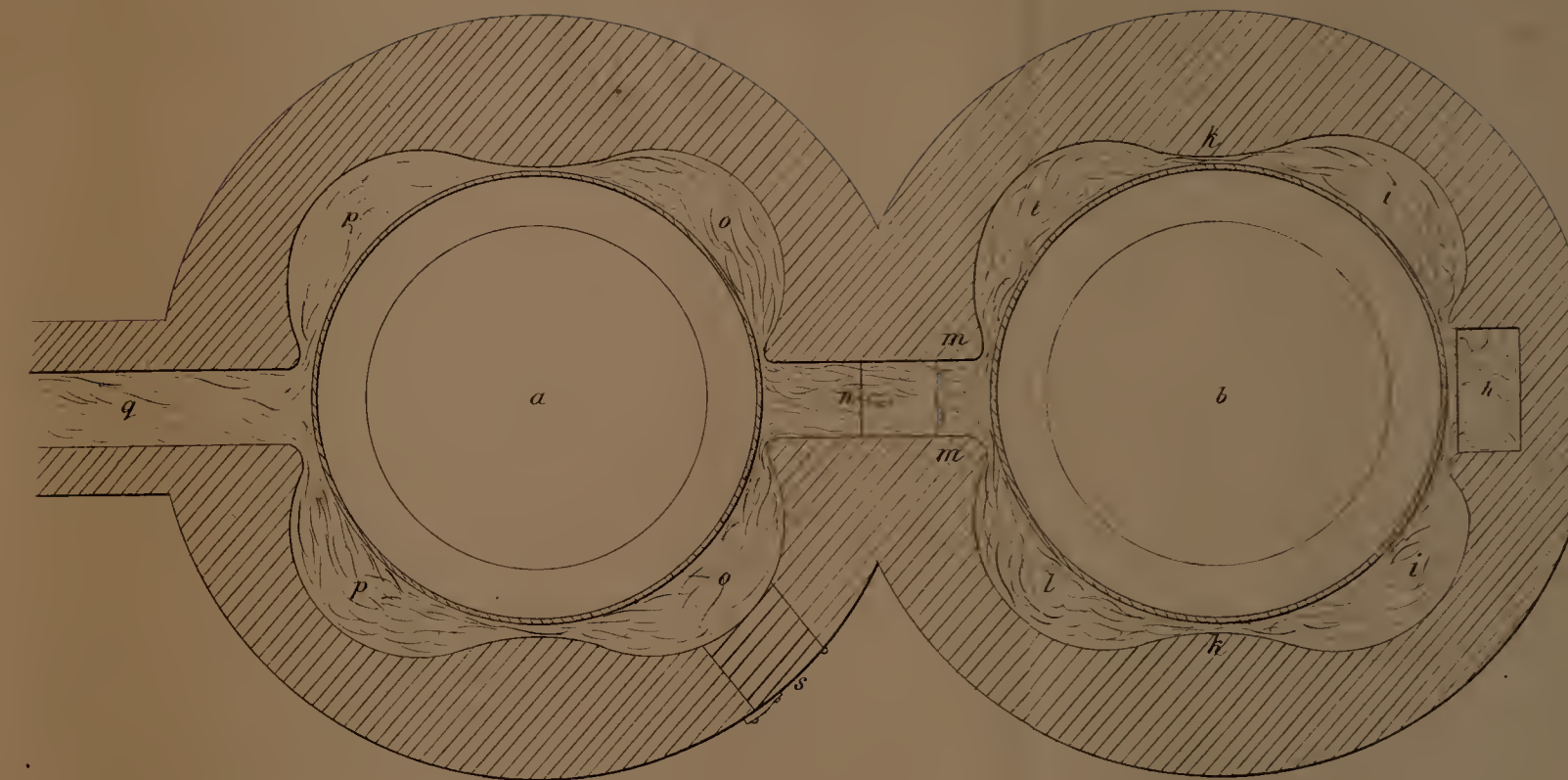


FIG. 2.



The enrolled drawing is colored.

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Partridge's Improvements in Setting or Fixing Steam Boilers, &c.

thought desirable to carry the flues round the boilers by what is termed a wheel draft instead of a divided draft as described, under which circumstance the chimney will be at the reverse end to that shewn in Fig. 1 ; this I consider to be more particularly applicable to the boilers of steam engines. Should it be
5 found necessary to lower the heat of the flues to prevent the coppers from boiling, a door or damper may be opened in the side of the brickwork, as *s*, which will admit cold air into the flues and thereby effect the object. This plan is applicable to the setting or fixing a great variety of boilers, whether opened or closed, as the boilers employed by dyers, brewers, soap makers,
10 scowerers, and divers other trades, as also to the boilers of steam engines. The further improvement which I propose, for the purpose of effecting the consumption of smoke, consists in the introduction of a door or slider, *t*, at the mouth of the furnace, which not only excludes the cold atmospheric air from the furnace during the time that the coal is being introduced on to the feed
15 plate *v*, but also enables the coal there deposited to become baked and converted into coke. This door or slider may be introduced in its place as shewn, either by sliding laterally in grooves or by rising up through an aperture in the feed plate, as represented in the Drawing, or in various other ways, and may be worked by a lever, or rack and pinion, or some such contrivance—a
20 mode of doing which would immediately occur to any competent mechanic. In feeding the furnace after it is ignited, it is necessary first to close the slider or door, by which the admission of cold air is prevented, and there to introduce the coal at the outer door *u* on to the feed plate. The outer door *u* being closed, the slider *t* must be removed, and by means of a scraper or rake, the handle of
25 which passes through a small hole in the outer door, the coal may be pushed forward on to the grate of the furnace without admitting cold air, or such a quantity as would in any perceptible degree damp the flues. As a portion of smoke and combustable vapours will be given out from the coal while baking upon the feed plate, between the two doors *u* and *t*, it will be necessary to
30 permit it to pass over or through an aperture in the door *t*, by which means the smoke and other vapour generated in that chamber will pass through the fire and become perfectly consumed.

Having thought it necessary to describe as above the particular construction of a furnace or furnaces built upon this plan, I wish it to be understood that
35 I do not confine myself to the exact forms represented, but consider that the principles of my Invention may be retained under various modifications; therefore I claim as the particular feature of my Invention the chambers or reservoirs for retaining the heat either curved or angular, and the setting of two or more boilers to be heated by one furnace, and also the introduction of a door

Partridge's Improvements in Setting or Fixing Steam Boilers, &c.

or slider at the furnace mouth, between the outer door and the fire; and the manner above described for the purpose of excluding the cold air and of more effectually consuming the smoke.

In witness whereof, I, the said Nathaniel Partridge, have hereunto set my hand and seal, this Eleventh day of August, in the year of our Lord One thousand eight hundred and twenty-three.

NATH^L (L.S.) PARTRIDGE.

NEWMAN, Extra.

AND BE IT REMEMBERED, that on the Eleventh day of August, in the year of our Lord 1823, the aforesaid Nathaniel Partridge came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamp't according to the tenor of the Statute made for that purpose. 10

Inrolled the Thirteenth day of August, in the year of our Lord One thousand eight hundred and twenty-three. 15

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